

Listing of Claims:

1. (Currently Amended) A method of combined source-channel decoding of digital data ~~encoding discrete values or symbols (i, j, etc.)~~ received by an input convolutional channel decoder (51) of a digital data combined source-channel turbo-decoder (50) from a source (10) over a transmission channel ~~(40)~~, wherein the digital data is the result of the transmission of symbols (i, j) from a source, the symbols having been source encoded by a source encoder and the source encoded symbols having been channel encoded by a channel encoder before transmission through the transmission channel, the method comprising the steps of:

~~applying a priori probabilities (p(i), p(i/j)) associated with said symbols to a channel decoding trellis of said input convolutional channel decoder (51); and~~

estimating the source encoded symbols from bits output by a convolutional channel decoder of the combined source-channel turbo-decoder;

statistically estimating, at each iteration of the combined source-channel turbo-decoder (50), said a priori probabilities from (p(i), p(i/j)) occurrences or transitions of the estimated source encoded symbols estimated by said turbodecoder (50), and

applying said a priori probabilities (p(i), p(i/j)) associated with said source encoded symbols to a channel decoding trellis of said input convolutional channel decoder.

2. (Cancelled).

3. (Currently Amended) The combined decoding method according to claim 1, wherein said a priori probabilities are probabilities (p(i)) of occurrences of the source encoded symbols.

4. (Currently Amended) The combined decoding method according to claim 1, wherein said a priori probabilities are probabilities ($p(i/j)$) of transitions between the source encoded symbols.

5. (Cancelled).

6. (Cancelled).

7. (Currently Amended) The combined decoding method according to claim 1, wherein said symbols are source encoded by variable length codes (VLC) represented by a binary tree of finite size, wherein the estimating of the source encoded symbols is carried out via a table-based VLC decoder; and said a priori probabilities ($p(i)$, $p(i/j)$) are associated with each branch of said tree and applied to the corresponding stages of said channel decoding trellis.

8. (Currently Amended) A combined source-channel turbodecoder (50)-for digital data, comprising:

an input convolutional channel decoder (51)-adapted to receive:

digital data transmitted ~~from a source (10)~~ over a transmission channel (40), wherein the digital data is the result of the transmission of symbols (i, j) from a source, the symbols having been source encoded by a source encoder, the source encoded symbols having been channel encoded by a channel encoder before transmission through the transmission channel, and ~~encoding discrete values or symbols (i, j, etc.) and~~

a priori probabilities associated with said source encoded symbols;

an output convolutional channel decoder ~~(51')~~;

means for estimating source encoded symbols from bits output by the convolutional channel decoder;

a generator ~~(54)~~-of histograms of occurrences or transitions of the estimated source encoded symbols ~~estimated by the output convolutional channel decoder (51')~~;

means ~~(55)~~-for calculating said a priori probabilities ($p(i)$, $p(i/j)$) associated with said estimated source encoded symbols; and

means ~~(56)~~-for applying said a priori probabilities to a channel decoder trellis of the input convolutional channel decoder ~~(51)~~.

9. (Currently Amended) The combined source-channel turbo-decoder according to claim 8, wherein said channel decoding trellis produces bit ~~binary~~-values ~~((0, 1) or (-1, 1) considering modulation)~~ and said means for applying said a priori probabilities comprise a module ~~(56)~~-for converting symbol a priori probabilities ($p(i)$, $p(i/j)$) into probabilities of bit ~~binary~~-values ~~((0, 1) or (-1, 1))~~.

10. (Currently Amended) The combined source-channel turbo-decoder according to claim 8, wherein said a priori probabilities are probabilities ($p(i)$) of occurrences of the source encoded symbols.

11. (Currently Amended) The combined source-channel turbo-decoder according to claim 8, wherein said a priori probabilities are probabilities ($p(i/j)$) of transitions between the source encoded symbols.

12. (Cancelled).

13. (Cancelled).

14. (Currently Amended) The combined source-channel turbo-decoder according to claim 8, wherein said symbols are source encoded by variable length codes (VLC) represented by a binary tree of finite size, wherein the means for estimating source encoded symbols comprise a table-based VLC decoder, and wherein said a priori probabilities ($p(i)$, $p(i/j)$) are associated with each branch of said tree and applied to the corresponding stages of said channel decoding trellis.

15. (New) The method according to claim 1, wherein estimating said a priori source encoded symbol probabilities ($p(i)$, $p(i/j)$) comprises generating histograms of occurrences or transitions of the estimated source encoded symbols.

16. (New) The method according to claim 1, wherein applying said a priori source encoded symbol probabilities ($p(i)$, $p(i/j)$) comprise converting symbol probabilities into bit probabilities.